

Claims

1. (Cancelled)

2. (Previously Presented) A process for recovering polyamide material having an initial average molecular weight from post-industrial and post-consumer products containing the polyamide material and insoluble materials, the process comprising the steps of:

contacting the post-industrial and post-consumer products with a suitable solvent in a reactor;

dissolving and partially depolymerizing the polyamide material in the solvent to form a solution by operating the reactor at a predetermined temperature and pressure and for a time sufficient to decrease the average molecular weight of the partially depolymerized polyamide to between about 25% to about 90% of the initial average molecular weight;

separating the insoluble material from the solution;

recovering the partially depolymerized polyamide from the separated solution; and

repolymerizing the depolymerized polyamide.

3. (Original) The process of claim 2, wherein the repolymerized polyamide has an average molecular weight substantially the same as the initial average molecular weight.

4. (Previously Presented) The process of claim 2, wherein the solvent is an aliphatic alcohol.

5. (Original) The process of claim 4, wherein the solvent is anhydrous methanol.

6. (Original) The process of claim 4, wherein the solvent is a solution containing at least 90% methanol.

7. (Original) The process of claim 4, wherein the solvent is anhydrous ethanol.

8. (Original) The process of claim 4, wherein the solvent is a solution containing at least 90% ethanol.

9. (Previously Presented) The process of claim 2, wherein the reactor is operated at a temperature between 160°C and 210°C and a pressure sufficient to keep the solvent in liquid phase for 30 to 400 minutes.

10. (Original) The process of claim 9, wherein the pressure is at least 350 psig.

11. (Original) The process of claim 2, wherein the repolymerization occurs through a solid-phase repolymerization process at a temperature between 160°C and the temperature at which the polyamide melts.

12. (Original) The process of claim 2, wherein the repolymerization occurs through a melt-phase repolymerization process at a temperature above the melting temperature of the polyamide.

13. (Previously Presented) The process of claim 2, wherein the insoluble material is separated by passing the solution through suitable filtration means.

14. (Presently Presented) The process of claim 13, wherein the filtration means is selected from the group consisting of glass fibers, insoluble material residue and a combination thereof.

15. (Original) The process of claim 14, wherein the filtration means comprises insoluble material residue that has accumulated on the filtration means.

16. (Original) The process of claim 14, wherein the filtration media is glass fibers.

17. (Previously Presented) The process of claim 2, wherein the depolymerized polyamide is recovered by a method selected from the group consisting of precipitation of the depolymerized polyamides, spray drying, and flash evaporation.

18. (Original) The process of claim 17, wherein the depolymerized polyamide is recovered by cooling the separated solution to a temperature sufficient to cause precipitation of the depolymerized polyamides.

19. (Original) The process of claim 17, wherein the depolymerized polyamide is recovered by adding to the separated solution an anti-solvent agent to cause precipitation of the depolymerized polyamides.

20. (Original) The process of claim 18 or claim 19, further comprising the step of purifying the separated solution after the depolymerized polyamide is recovered, and using the purified solution as the solvent in step (a).

21. (Previously Presented) The process of claim 2, wherein the post-industrial and post-consumer products include one or more of carpet waste, glass-reinforced nylon, air-intake manifolds, radiator end-caps, coated fabrics, air bag fabrics and mineral-filled nylon.

22. (Previously Presented) A process for recovering polyamide material having an initial average molecular weight from post-industrial and post-consumer products containing the polyamide material and insoluble materials, the process comprising the steps of:

contacting the post-industrial and post-consumer products with a suitable solvent in a reactor;

dissolving and partially depolymerizing the polyamide material in the solvent to form a solution by operating the reactor at a predetermined temperature and pressure and for a time sufficient to decrease the average molecular weight of the partially depolymerized polyamide to between about 25% to about 90% of the initial average molecular weight;

separating the insoluble material from the solution; and

recovering the partially depolymerized polyamide from the separated solution, wherein the insoluble material includes TiO_2 .

23. (Previously Presented) The process of claim 2, wherein the insoluble material includes TiO_2 .